

the dangerous action of the nitrous vapours, by placing here and there upon the piles saucers containing ammonia, which condenses them.

Each table, as we have said, forms a battery of sixty elements. The electric wires are conducted along the wall at the bottom of the room, where they traverse six galvanometers (Fig. 6). Each of these galvanometers indicates, by means of the needle with which it is provided, the condition of the battery to which it corresponds. The six isolating wires, after leaving the six galvanometers, pass along the walls to the stage, where the currents which they carry may be utilised either singly or by twos or threes, according to the degree of intensity which it is wished to give to the light. The distance which the current runs from the electric room to the most distant point of the stage is about 122 metres; the total length of all the wires is about 1,200 metres.

M. Duboscq, imitating the systems of telegraphic wires, makes use of the earth as a return current; one of the poles of each battery is in communication with the iron of the building. Without this arrangement it would have been necessary to double the length of the wires.

In most instances M. Duboscq places his electric lamp on one of the wooden galleries which run along the higher regions of the scenery above the stage. It is from this artificial sky that he, a new Phœbus, darts upon the nymphs of the ballet the rays of his electric sun. It is from here, decomposing the light by means of the vapour of water, he throws upon the stage a veritable rainbow, as in *Moses*; again, it is thus that he causes the light from the painted windows to fall upon the flags of the church where Margaret is in the clutches of remorse. Sometimes the electric apparatus is placed on a level with the stage, when it is sought to produce certain special effects, such as that of the fountain of wine in Gounod's opera. The lime-light is also used to produce certain brilliant effects in the New Opera.

It will thus be seen that the electrical arrangements in the New Opera leave little to be desired. There is an electric battery of extraordinary power, which might be profitably used for certain experiments of high interest, requiring an electric power of great intensity. M. Tisandier makes the very happy suggestion that this powerful battery might be utilised for the purpose of scientific research, and we hope that those who have the management of the Opera will take his hint; they ought to remember how much their art owes to the researches of science. He also very appropriately suggests that the Government which has made such a lavish expenditure, forty million francs, on a place of amusement, might also benefit the country even more by doing something to restore to efficiency the buildings in which the work of science is carried on. At all events it will be seen that in this magnificent building Science occupies a place of no mean importance.

NOTES

LETTERS have been received from the Eclipse Expedition from Suez. They had heard from the Viceroy that arrangements had been made to have a vessel awaiting them at Galle.

THE following telegram has been received by the *Times* from its St. Petersburg correspondent, with regard to the Transit of Venus:—"Herr Struve reports that at Hakodaki both interior contacts were observed. At Wakhodka, on the coast of the Pacific east of Vladivostock, only the first interior contact was observed. At Kamen Riboloff, on Lake Hanka, all four contacts were satisfactorily observed, but no heliometric measurements. At Ashooradeh, on the Caspian Sea, some diameters and chords were measured; but the sun was covered by clouds at the moment of contact. No report yet from Pekin." We would also call

attention to the account of the French observations in New Caledonia, which we publish this week, and to the interesting letter in yesterday's papers from Capt. Fairfax, of the *Volage*, to the Admiralty, giving some details of the Kerguelen Island parties. The astronomers, he says, are pleased with their success. News has now been received more or less from all the Kerguelen parties; we hope to be able to summarise them next week.

PROF. C. S. LYMAN writes to the *New York Tribune* to say that he observed the planet Venus on the 8th of December, a few hours before its transit began, and found that from the time when it was $1^{\circ} 50'$ distant from the sun's centre, up to the time of its passage across its disc, it was apparently surrounded by a ring of light, which appearance was due to the refraction of the sun's light passing through the planet's atmosphere on its way to the earth. This phenomenon was first observed by Prof. Lyman in 1866, and will again occur in 1882, being repeated, in fact, as often as the planet approaches within the limiting distance above mentioned. When further from the sun than this limit, the circle of light becomes a segment only, whose size diminishes as the planet recedes from the sun.

MR. SLATER, one of the naturalists sent out by the Royal Society with the Transit of Venus Expedition to Rodriguez, is now on his way home. Dr. Balfour, who, after his special work, has devoted a month to the Island of Bourbon, is expected to arrive in England at the end of the present month. The collections made have been embarked, and there is reason to hope that in the course of a few weeks we shall be in possession of a complete report of all that has been accomplished by the three young men appointed to explore the singular island Rodriguez. An instalment of their results has already appeared in the Proceedings of the Royal Society. In like manner, Mr. Gulliver is devoting a month to marine zoology at Zanzibar.

THE list of candidates for the Fellowship of the Royal Society is closed for the present session. The number up is fifty-four.

WE hope that advantage will be taken of the *conversazione* of the Royal Society which is to be held on the 7th April, to exhibit the improvements effected in philosophical apparatus during the past year. It has happened more than once that an important improvement has been shown for the first time at the Royal Society, and we shall be glad if the practice can be continued. The rapidity with which instruments become obsolete in these days is perhaps the most remarkable evidence of the advance of science.

THE large and influential deputation from University College which waited upon the Duke of Richmond and Viscount Sandon on Tuesday received what we think may be regarded as on the whole a satisfactory reply. The deputation showed that the means and buildings and apparatus at the command of the College are totally inadequate to the present advanced position of science and to the efficient discharge of the work which the much underpaid professors have to perform. The Duke of Richmond's reply shows, we think, that the Government are really anxious to help the cause of science and of education as far as the means at their command will enable them. He rightly said that the movement which caused the deputation to wait upon him and his colleague is a legitimate one. "I think," he said, "it would be advantageous to us in considering this question if the Council of the College could see their way to lay before us some estimate of the sum of money that they would seek from the Government, and the mode in which they would propose to spend the money if a sum were granted." This seems to us quite reasonable, and augurs well for the cause of those institutions which can really prove that they deserve to be helped.

As was to be expected, the estimates for the Arctic Expedition were passed by the House of Commons last Friday with complete unanimity. The sum asked for was 98,620*l.* There was appended to the estimate a further sum of 16,000*l.* for the next financial year; and for future years, while the expedition is out, there will be an additional sum of 13,000*l.* In addition to all this, there is a contingent possibility of about 50,000*l.* being required in case of its being thought necessary or desirable to send out a relief ship in consequence of the expedition not having returned as soon as was expected. We do not think it likely that this last item will ever be required, though it is creditable to the House that not a voice was raised against any of the items in the estimate. It has been decided that a man-of-war will accompany the expedition as far as Upernivik, where she will fill the ships up with coals and provisions. It is stated that the *Pandora*, which was one of the vessels named for the expedition, but was condemned on survey, has been purchased from the Admiralty by Mr. Allen Young, a lieutenant in the Royal Naval Reserve, and it is rumoured that he will assume command of her, and accompany the *Alert* and *Discovery* during the summer. Mr. Young served with Admiral Sir Leopold M'Clintock on board the *Fox* in the Franklin Search Expedition.

SOME official papers concerning the Arctic Expedition have just been published by the Admiralty; these contain the arguments which have been urged on behalf of the Smith Sound route, as well as details concerning the fitting of the ships, appointment of officers and men, &c., with which our readers are already familiar. The chosen route offers the only promise of a continuous coast-line stretching far northwards, and upon this fact the prospect of reaching the Pole by travelling parties mainly depends. It is, moreover, the only route, so far as our knowledge extends, where the operations of an expedition can be confined within such limits that succour would be reasonably certain of reaching it. Along with the papers an Admiralty Chart of the Polar Sea is published. Rear-Admiral Sir F. Leopold M'Clintock will supply each of the two ships with a copy of his own manuscript notes on the fitting of sledges and tents, the scale of clothing and provisions, and all the results of his own experience in sledge travelling. The article on the work of the Arctic Expedition, in the last number of the *Geographical Magazine*, is mainly taken from these notes.

WE regret very much that it has been finally decided that no professional geologist shall accompany the Arctic Expedition, the main reason, we believe, being the want of accommodation. The fact is that a botanist is to be sent out who is not wanted, as one of the surgeons is a good botanist; while the place required for a geologist is thus uselessly occupied. The expedition is nothing if not scientific, and surely geology is one of the sciences in which some of the most valuable results would be obtained by an expedition to high polar lands. In this connection we would draw our readers' attention to the first instalment of a paper in this week's *NATURE*, giving some valuable details of the scientific results of the Austro-Hungarian Expedition. If the results of our expedition be as valuable in proportion to its size and equipment, we may expect science to reap a large harvest indeed.

A LETTER from Captain David Gray appears in Hest iii. of Petermann's *Mittheilungen*, giving reasons for his preference of the East Greenland-Spitzbergen route for Polar exploration over the Smith Sound route. It is accompanied by an illustrative map.

To note the appearance of a new scientific society is one of the chief pleasures in recording the progress of science; and when the incident occurs in the midst of a community given up

to commerce, the pleasurable feeling is enhanced. A Society has been started in Trieste, that busy port at the head of the Adriatic, under the title "*Società Adriatica di Scienze naturali*;" or, as the German-speaking portion of the inhabitants call it, "*Naturwissenschaftliche Adriatische Verein*." We have received a list of the members, a copy of the statutes, and the first number of the *Bollettino*. This, an octavo of about sixty pages, published in December last, contains an address by Dr. Syrski on the objects of the Society, and on the advantages generally of the study of natural history; a paper, with illustrations, on the "*Organi della riproduzione e della fecondazione dei pesci ed in ispezialità delle Anguille*;" and one of much interest, "*Sulle attuali cognizioni chimiche del mare Adriatico*." These papers exemplify the scheme which the Society has formed—investigation of the Adriatic and its coasts, and the promotion of a knowledge of natural history. In carrying out this scheme there are many important questions which may be elucidated, especially in a southern latitude, and we offer to the new Society our best wishes for its success. We hope it will find many correspondents in this country.

THE Ateneo Propagador de las Ciencias Naturales offers a prize of 500 pesetas (about 20 guineas) for the best original memoir on the mineralogy, botany, or zoology of Spain. Any person, whether a member of the society or not, can compete for this prize. Memoirs must be sent in to the secretary of the society before the 30th September, 1875. A printed paper with further particulars may be procured from the secretary, whose address is Calle Ancha de San Ferrando, 15, Madrid.

THE new part of the official Topographical Atlas of Switzerland contains the first part of a new hydrographic map, in four sheets, of the Lake of Geneva, the result of a recent minute examination of the lake by the Government engineer, M. Ph. Gosset. From these sheets a clear and precise idea of the configuration of the lake may be obtained, and M. Gosset's examination confirms generally that of De la Beche made about fifty years ago, the former, however, being infinitely more precise and detailed. The bottom of the lake forms a large valley bordered by two slopes (*talus*). The length of this plain is about six kilometres; its bottom is very flat, and the inequalities never exceed ten metres in a transverse section of the lake. Profiles taken perpendicularly to the axis of the lake are nearly all contained between two curves of ten metres in height. There is nothing in the axis of the lake like a longitudinal valley; on the contrary, there is rather a slight median elevation, and two lateral valleys, not strongly marked, along the foot of the slope. One interesting result of M. Gosset's examination is to confirm the absence, in the depths of the lake, of accidents, inequalities, rocks, glacial moraines, and erratic blocks. Further details of this valuable map may be obtained in an article by Dr. Forel in the January number of the *Archives des Sciences* of the *Bibliothèque Universelle*. The article has also been separately reprinted.

WE regret very much the news that the expedition which started from Burmah into China some time ago (see *NATURE*, vol. xi. pp. 175 and 209), has met with a disaster. On February 22, at a place called Mauwine, it was attacked by several hundred Chinese, together with a large number of the hill tribes. The main body of the expedition escaped with three wounded, but losing it is feared, either the greater part or the whole of its baggage. Moreover, a distinguished Engineer officer, Mr. Margary, who had made his way overland from Burmah to form the expedition, was separated from it, and with five Chinese servants surrounded and killed.

THE recent polar weather has told heavily upon French men of science. Every week a fresh death is reported, and this week we are apprised of the death of M. Louis Mathieu, at the age

of ninety years. M. Mathieu was elected fifty years ago to fill the place vacated by the death of Mestier. That celebrated comet-seeker of the eighteenth century had been himself a member of the Academy for fifty years. Two persons occupying the same seat for a period of more than a century is an example of academical hereditary longevity which is likely very seldom to occur. M. Mathieu was the brother-in-law of Arago, a circumstance which had added much to his personal credit and influence. He was a member of the Bureau des Longitudes, and editor of the *Annuaire* for more than sixty years. He had been employed in the first part of the century in connecting French and English triangulations.

THE supplementary part No. 42 of Petermann's *Mittheilungen*, advance sheets of which have been forwarded us, contains the first half of a translation from the Russian of the celebrated traveller Sewerzow's exploration of the Thian Shan Mountain System in 1867-68. A translation of the same traveller's exploration of the Tschu and Syr Darya region in 1864-65 appeared in the *Journal* of the Royal Geographical Society for 1870, by Mr. R. Mitchell. The present translation is accompanied with a magnificent chromolithographic map of the mountainous region around Lake Issyk-Kul, from Russian official surveys. Sewerzow made a careful study not only of the geography, but of all departments of the natural history, of the meteorology, and general physical characteristics of the region which he explored.

THE Council of the Senate of Cambridge University have had under their consideration the duties and stipend of the Jacksonian Professor. The Council are of opinion that it will be advantageous to the University, as well as in direct conformity with the design of the professorship, that the lectures of the professor should be directed hereafter, at least in part, to the illustration and advancement of the knowledge of some branch or branches of applied physics. They further recommend that the next Jacksonian Professor receive from the University chest such a sum as will with his endowment stipend raise the income of the professorship to 500*l.* per annum; that he shall be required to reside within the precincts of the University for eighteen weeks during term time in every academical year, to give one course of lectures in each of two terms at least, and to give not fewer than forty lectures in every academical year.

THE same body have recommended that a managing council, consisting of the Vice-Chancellor and twelve other members of the Senate, be appointed in connection with lectures and classes at populous centres; and that the Syndics be required to make an annual report to the Senate.

THE Council of the Pathological Society, we learn from the *British Medical Journal*, have arranged that a discussion shall be opened, by Dr. Charlton Bastian, F.R.S., at the meeting of April 6th, on the Germ-theory of Disease, being a discussion of the relation of Bacteria and allied organisms to virulent inflammations and specific contagious fevers. It is expected that Dr. Burdon-Sanderson will take part in the discussion; and it is hoped that, besides the members of the Society interested in this important subject, Prof. Lister of Edinburgh, and it may be Prof. Billroth of Vienna, will find opportunity of being present and taking part in the debate.

AT the last *soirée* of the Paris Observatory, M. Cornu made some exceedingly interesting experiments with his apparatus for measuring the velocity of light. The mirror for reflecting the ray had been placed on the top of a barrack at only 1,280 yards from the Observatory. The wonderful effect of the extinction of the ray by a certain speed of rotation of the wheel was easily observed, as also its reappearance with an increased velocity. The cloudy state of the atmosphere did not prevent the experiment from being a success. It is expected

that the apparatus will be sent to the next meeting of the British Association.

AT a recent meeting of the Senate of the University of London, it was resolved that there is no sufficient reason for perpetuating the slight differences which at present exist between the curricula of the Women's General Examination and the Matriculation Examination; and that in and after the year 1876 the curriculum of the Women's General Examination be the same as the curriculum for the time being of the Matriculation Examination, except that, in the year 1876, women shall have the option of being examined according to the present instead of the altered curriculum.

THE meeting of delegates of the French Sociétés Savantes will take place at the Sorbonne after Easter, as usual, and will have a special interest for meteorologists. M. Leverrier, who will be appointed the President of the Commission of Sciences, has sent a circular to the several presidents of the Meteorological Commissions, asking them to send as many meteorologists as they can to Paris on that occasion; the intention of the Ministry being to call a special Congress for Meteorology in order to group together the various Departments into natural meteorological districts.

THE destruction of seals in the Arctic seas has been carried on to such an extent that fears are entertained of the annihilation of these animals. The Peterhead sealers and whalers have therefore determined to agree to a "close time," during which it shall be unlawful for any sealing-ship to kill seals, or even to leave port for the fishing-grounds; thus giving the newly-born seals time to develop into a useful size, and enabling even the parent-seals to escape. It is hoped to extend this regulation to other countries engaged in the industry; and the Board of Trade has been in correspondence with various authorities on the subject. The papers in connection with the case have been presented to Parliament, and will shortly be printed, when the decision of the Government will probably be made known.

THOUGH Indian tobacco is not much esteemed in this country, owing to its being badly prepared, some 796,000 acres of land are under tobacco cultivation, distributed as follows:—In the Bombay Presidency over 40,000 acres; in the Punjab, over 90,000; in Oude, 69,574; in the Central Provinces, 55,000; in Behar, 18,500; in Mysore, 20,000; in Burmah, 13,000; while in Bengal there are some 500,000 acres.

WE learn that the export of cinchona bark from the Nilgiri hills, on the part of the Government, during 1872-73, the first regular year of export, amounted to over 20,000 lbs., which realised 4,000*l.* in the London market. It is anticipated that the returns of the exports for the past year, 1873-74, would show a similar quantity, and that the trade in future years will rapidly increase. Bark from private cinchona plantations in the East Indies and Ceylon appears regularly in the London market, fetching from 10*d.* to 4*s.* per lb. "Very good average prices," it is said, "as compared with those obtained by the South American barks."

THE additions to the Zoological Society's Gardens during the past week include a Hog Deer (*Cervus porcinus*) from Kurrachee, presented by Mr. H. Hughes; a White-crowned Mangabey (*Cercocebus ethiops*) from West Africa, presented by Mr. W. Gordon Patchett; an Egyptian Jerboa (*Dipus aegyptius*) from Egypt, presented by Mr. A. Carey, R.N.; an Anubis Baboon (*Cynocephalus anubis*) from W. Africa, presented by Mr. R. B. N. Walker; an Indian Wild Dog (*Canis primævus*) from India, presented by H.E. the Governor-General of India; three Crested Falcons (*Baza lophotes*), two Indian Cobras (*Naja tripudians*), two Indian Eryx (*Eryx johnii*) from India, purchased.